## This Page Is Inserted by IFW Operations and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

## IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents will not correct images, please do not report the images to the Image Problem Mailbox.



	1
p <sup>+</sup> - Al <sub>z</sub> Ga <sub>1-z</sub> N	
Al <sub>v</sub> Ga <sub>1-v</sub> N	
$Al_xGa_{1-x}N$	
Alternately layered Al <sub>x</sub> Ga <sub>1-x</sub> N/Al <sub>y</sub> Ga <sub>1-y</sub> N films	MQW
$Al_xGa_{1-x}N$	l layer
$Al_{\nu}Ga_{1-\nu}N$	
$Al_xGa_{1-x}N$	
$Al_{y}Ga_{1-y}N$	
$n^+$ - $Al_wGa_{1-w}N$	
AlN film	
Substrate	

FIG. 1

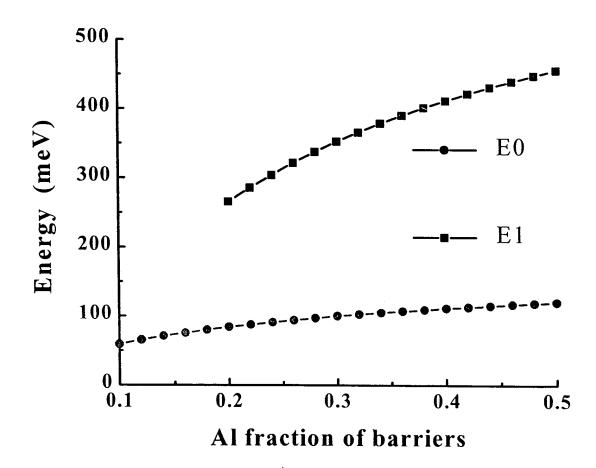
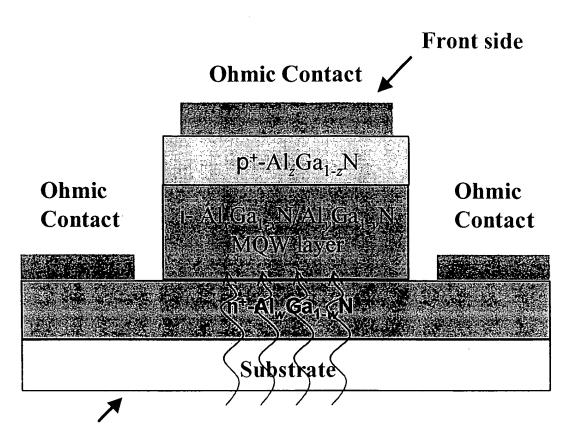


FIG. 2



Polished backside

FIG. 3

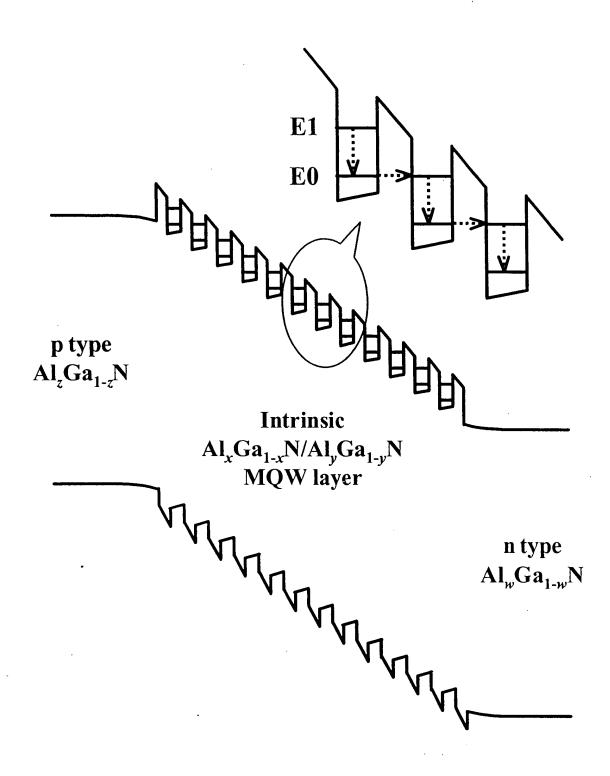


FIG. 4

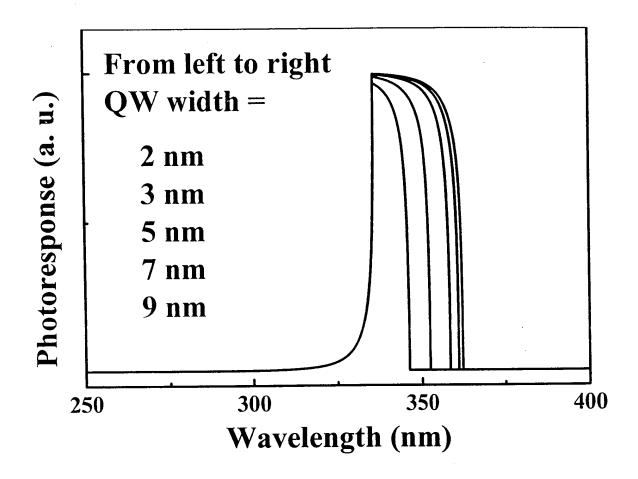


FIG. 5

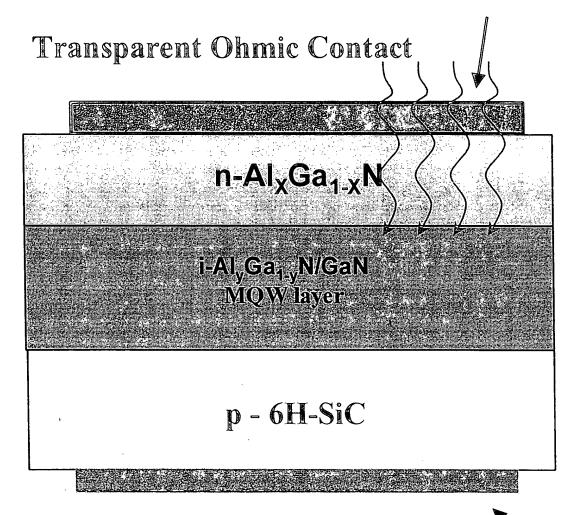
_		
	Al <sub>0.33</sub> Ga <sub>0.67</sub> N(10 nm) cap layer	
	Al <sub>0.25</sub> Ga <sub>0.75</sub> N(4 nm)/Al <sub>0.33</sub> Ga <sub>0.67</sub> N(4 nm) X 25 period, Mg doped, 1x10 <sup>19</sup> cm <sup>-3</sup>	Ma doned
		Mg doped 1x10 <sup>19</sup> cm <sup>-3</sup>
	Al <sub>0.33</sub> Ga <sub>0.67</sub> N, 4 nm	
	Al <sub>0.25</sub> Ga <sub>0.75</sub> N, 4 nm	
G	aN(4 nm) /Al <sub>0.25</sub> Ga <sub>0.75</sub> N(7 nm) X 25 period	
	Al <sub>0.25</sub> Ga <sub>0.75</sub> N, 7 nm	
	GaN, 4 nm	undoped
	Al <sub>0.25</sub> Ga <sub>0.75</sub> N, 7 nm	
	GaN, 4 nm	
	Al <sub>0.25</sub> Ga <sub>0.75</sub> N, 5 nm	
	n-GaN, 1 um	Si doped
	Si doped, $1 \times 10^{18}$ cm <sup>-3</sup>	or doped
	AlN, 10 nm	
	Sapphire (0001), c-axis	·

FIG. 6

n-Al<sub>0.2</sub>Ga<sub>0.8</sub>N, 1.5 um Si doped, 1x10<sup>18</sup> cm<sup>-3</sup>  $Al_{0.27}Ga_{0.73}N$ , 5 nm GaN, 4 nm X 40 period QW GaN, 4 nm  $Al_{0.27}Ga_{0.73}N$ , 7 nm GaN, 4 nm Al<sub>0.27</sub>Ga<sub>0.73</sub>N, 7 nm GaN, 4 nm  $Al_{0.27}Ga_{0.73}N$ , 5 nm AlN, 10 nm p- 6H-SiC, 1 x 10<sup>18</sup> cm<sup>-3</sup>

**FIG.** 7

Front side



**Ohmic Contact** 

**Back side**